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Part X

Department of Energy

Sampling Requirements of Consumer Product; Test Procedures; Final Rule

DEPARTMENT OF ENERGY

10 CFR Part 430

Final Rulemaking Regarding the Sampling Requirements of Consumer Product; Test Procedures

AGENCY: Department of Energy

ACTION: Final rule.

SUMMARY: The Department of Energy amends the sampling provisions of its test procedures for refrigerators and refrigerator-freezers, freezers, dishwashers, clothes dryers, water heaters, room air conditioners, home heating equipment (not including furnaces), television sets, kitchen ranges and ovens, clothes washers, humidifiers and dehumidifiers, and furnaces. The test procedures are a part of the energy conservation program for consumer products established under the Energy Policy and Conservation Act and are intended to provide standard methods of determining energy consumption for consumer products covered by the program. The test procedures amended by this notice are applicable to any testing of consumer products required under the Energy Policy and Conservation Act relating to representations respecting the energy consumption of, or the cost of energy consumed by, such products and relating to the labeling of such products.

EFFECTIVE DATE: May 14, 1979.

FOR FURTHER INFORMATION CONTACT: James A. Smith, Department of Energy, Mail Station 2221C, 20 Massachusetts Avenue, N.W., Washington, D.C. 20545; 202–376–4814.

Robert Mussler, Office of the General Counsel, 20 Massachusetts Avenue, N.W., Room 3224, Washington, D.C. 20545; 202–376–9472.

SUPPLEMENTARY INFORMATION:

A. Background

Title III, Part B, of the Energy Policy and Conservation Act ("ACT") (42 U.S.C. 6291 et seq.) establishes an energy conservation program for consumer products ("program"). The program is designed to encourage manufacturers to produce, and consumers to purchase, significantly more energy efficient consumer products. The Act divides major responsibilities for accomplishing these goals between the Department of Energy ("DOE") and the Federal Trade Commission ("FTC"). Section 323 of the Act directs DOE to develop test procedures for the program. Section 325 directs DOE to establish mandatory energy efficiency standards for the consumer products included in the program. DOE will issue a notice proposing standards for nine of these products later this year. Section 324 directs FTC to prescribe consumer product labeling rules which, through use of information derived from performing the DOE test procedures, will provide consumers with information regarding energy consumption which will be of assistance in making purchasing decisions. The FTC also has responsibility for assuring that representations respecting energy consumption and energy costs conform with the requirements of section 323(c) of the Act.

Section 323(b)(1) requires that the test procedures prescribed by DOE not be unduly burdensome to conduct. DOE has recognized that manufacturers cannot reasonably be required to test each individual unit which they produce. Therefore, DOE has proposed and promulgated test procedures for each type of consumer product covered by the program (sometimes referred to as "covered product") which include sampling provisions designed both to maximize the confidence with which test results of units actually tested can be applied to units of the same basic model not tested and to minimize the testing burden on manufacturers.

Since only the program aspect concerning representations subject to section 323(c) was operative at the time final test procedures were prescribed, DOE promulgated sampling provisions (10 CFR 430.24) applicable only to testing in connection with the representations subject to section 323(c). In so doing, DOE recognized the eventual necessity for amending the test procedures to prescribe sampling provisions for other aspects of the program as those other aspects became operative.

On July 14, 1978, FTC issued proposed labeling rules, including provisions covering section 323(c) representations, for covered products under section 324 ("Rules for Using Energy Cost and Consumption Information in Labeling and Advertising of Consumer Appliances under the Energy Policy and Conservation Act," 43 FR 31806, July 21, 1978).

To complete the test procedures which these FTC rules will utilize, on September 5, 1978, DOE issued a notice of proposed rulemaking, ("Proposed Rulemaking and Public Hearing Regarding Sampling Requirements of Appliance Test Procedures," 43 FR 40192, September 8, 1978) to amend its test procedures by adding § 430.23 to specify sampling provisions which will be applicable to both relevant program aspects, i.e., labeling under section 324 of the Act and representations under section 323(c) of the Act.

DOE held a public briefing on the proposed sampling provisions on September 18, 1978. This briefing included a discussion of methods of computing the number of units to be tested and a review of the types of information which would better enable DOE to resolve any issues raised in the proposal.

Documents entitled "Determining the Number of Units to be Tested for Sampling Methods Employing One-Sided Confidence Limits" and "Determining the Number of Units to be Tested for Sampling Methods Employing Two-Sided Confidence Limits" were prepared by DOE to provide a detailed technical explanation of the sampling methods under consideration. Copies were made available to all interested persons.

A joint public hearing on the FTC proposed labeling rule and the DOE proposed sampling rule was held from October 12, 1978 to November 3, 1978.

After reviewing all comments received and other available data, DOE today amends its test procedures by adding § 430.23 to specify sampling provisions which will be applicable to both relevant program aspects, i.e., labeling under section 324 of the Act and representations under section 323(c) of the Act for consumer products other than central air conditioners. Accordingly, except for paragraph 430.24(m) § 430.24 is deleted since the provisions in that section are covered by the new § 430.23. Paragraph 430.24(m), dealing with central air conditioners, remains and § 430.23(m) is reserved for central air conditioners in today's final rule. A provision that was in § 430.24 relating to kitchen ranges and ovens is moved to the kitchen ranges and ovens test procedures appendix where it more appropriately belongs.

Comments were received from individual manufacturers, trade associations, and consumer groups. Many comments were directed toward technically complex issues which require familiarity with statistics to be fully understood. Detailed technical explanation of sampling methods relevant to the program and referred to in this discussion of comments is presented in two documents prepared by DOE: "Determining the Number of Units to be Tested for Sampling Methods Employing Two-Sided Confidence Limits" and "Determining the Number of Units to be Tested for

Sampling Methods Used in Consumer Product Test Procedures." (This latter document is a revision of an earlier document entitled "Determining the Number of Units to be Tested for Sampling Methods Employing One-Sided Confidence Limits." The revision was made in order to include the phraseology used in today's final rule.) Copies are available upon request by contacting either James A. Smith, Department of Energy, Mail Station 2221C, 20 Massachusetts Avenue, NW., Washington, D.C. 20545, telephone 202–376–4814, or the Freedom of Information Office at Room GA152, Forrestal Building, 1000 Independence Avenue, S.W., Washington, D.C. 20585.

B. Discussion of Comments

1. Sampling plans utilizing one-sided confidence limits

The proposed sampling provisions were substantially identical to the sampling provisions already promulgated at 10 CFR 430.24 applicable to testing in connection with representations subject to section 323(c) of the Act. Proposed § 430.23 was intended to provide an acceptable level of assurance that test results would be applicable to all units of a basic model, without creating an undue testing burden for manufacturers. This sampling approach, described by "two-sided confidence limits," places both upper and lower limits on the range or interval in which the true mean is likely to be found. The benefit of the two-sided method is to maximize the precision of any representations respecting energy consumption. Under this approach, a specified range about any represented value of a measure of energy consumption must, with a specified degree of certainty, include the true mean.

The preamble to the proposed rule discussed another sampling approach described by "one-sided confidence limits." The one-sided method places either an upper limit or a lower limit on the range or interval in which the true mean is likely to be found. This method offers added flexibility by allowing for the testing of fewer units and therefore, reduced testing costs.

Most of those commenting recommended that DOE adopt sampling plans utilizing one-sided confidence limits rather than sampling plans utilizing two-sided confidence limits. It was stated that the principal benefit of sampling plans utilizing one-sided confidence limits is that they allow manufacturers to conservatively adjust measures of energy consumption. Specifically, manufacturers may use values higher than the mean for estimated annual operating cost, energy consumption or other measures of energy consumption for which consumers would favor lower values, and/or values lower than the mean for measures of efficiency (i.e., energy factor, energy efficiency ratio, seasonal energy efficiency ratio, annual fuel utilization efficiency defined and measured according to DOE test procedures) or other measures of energy consumption for which consumers would favor higher values.

The proposed sampling plan employing two-sided confidence limits required that a specified range about any represented value of a measure of energy consumption must, with a specified degree of certainty, include the true mean of such measure. This requires the true mean of the estimated annual operating cost to be, with a specified degree of certainty, both greater than or equal to the lower limit of the specified range about the represented value and less than or equal to an upper limit of the specified range. Commenters objected to this sampling plan because manufacturers may be in noncompliance for overstating estimated annual operating costs or otherwise rating products conservatively.

Commenters stated that manufacturers should be permitted to rate products conservatively. Commenters contended that consumers would actually benefit from conservative ratings because they would probably experience lower operating costs than would have been expected based on conservative values for estimated annual operating cost. Manufacturers would desire the opportunity to overstate estimated annual operating cost for several reasons. First, based on their knowledge and experience, manufacturers could overstate the estimated annual operating cost and understate the measure of efficiency to compensate for anticipated changes in the energy consuming characteristics of future production units of a particular basic model. Examples of the causes of possible future changes in energy consuming characteristics include wear on manufacturing equipment, process variations and tolerances of components. Second, overstating estimated annual operating cost can have the effect of reducing the number of units to be tested. (This is explained in "Determining the Number of Units to be Tested for Sampling Methods Used in Consumer Product Test Procedures," previously referenced.)

Sampling plans utilizing two-sided confidence limits were supported by one manufacturer and a consumer group on the grounds that such plans are likely to produce the most representative values of measures of energy consumption. Commenters noted that the purpose of displaying measures of energy consumption on consumer product labels was to assist consumers in making purchasing decisions. If manufacturers overstated estimated annual operating cost, as would be permitted by sampling plans utilizing one-sided confidence limits, then basic models which have the lowest estimated annual operating costs shown on the label may not be the same basic models which actually have the lowest operating cost. The ranking of estimated annual operating costs may be affected by the amounts of testing different manufacturers choose to perform and by the extent manufacturers choose to overstate estimated annual operating cost. DOE believes, however, that competitive pressures will encourage manufacturers to minimize the extent that estimated annual operating costs may be overstated. DOE believes, therefore, that the ranking of basic models by estimated annual operating costs will not be significantly affected by adopting sampling plans utilizing one-sided confidence limits.

Other sampling approaches, including those used for industry certification programs, were considered and rejected by DOE. One such plan permitted manufacturers to modify test units if it was found that such units failed to meet certain energy performance criteria. However, such modification would not normally be performed on units distributed in commerce. Represented values for measures of energy consumption may, therefore, be representative of modified units and not representative of units distributed in commerce. Therefore, DOE rejected this plan.

Still other plans, unlike the proposed or alternative sampling plans, specified a fixed number of units to be tested. Under these plans, the reliability of the measures of energy consumption could be expected to be high for basic models where test results among the units tested show little variability, and the reliability could be expected to be low where there was substantial variability. It should be noted, however, that a major purpose of testing is to provide reliable measures of energy consumption in order to assist consumers in making purchasing decisions. DOE believes that the sampling plan should be so constructed

that the reliability of measures of energy consumption is consistent within each product type. The sampling plans utilizing either one-sided confidence limits or two-sided confidence limits would require the number of units to be tested to be higher for basic models whose measures of energy consumption show high variability.

Other commenters recommended that DOE not specify any sampling plan at all and, instead, permit manufacturers to derive measures of energy consumption in any manner they choose. DOE believes, however, that in order to assure comparability of representations between different manufacturers complete test procedures should provide guidance as to how the results obtained by testing a small number of units should be used to determine the measures of energy consumption applicable to all the units of a basic model. Sampling plans provide this guidance.

DOE accepts the argument that a sampling plan utilizing one-sided confidence limits is necessary to enable manufacturers to compensate for anticipated changes in the energy consuming characteristics of future production units. The proposed sampling plans which utilized two-sided confidence limits would not provide manufacturers an advance opportunity to modify measures of energy consumption even when changes due to wear in manufacturing equipment, process variations and tolerances of components are anticipated.

For the reasons discussed above, sampling plans utilizing one-sided confidence limits are adopted in this final rule. Sampling plans utilizing one-sided confidence limits require different statements for the two types of measures of energy consumption. One type of measure includes estimated annual operating cost, energy consumption and other measures of energy consumption for which consumers would favor lower values. The other type of measure includes measures of efficiency and other measures of energy consumption for which consumers would favor higher values. In comparison, separate statements applying to the different types of measures of energy consumption are not needed for a sampling plan utilizing two-sided confidence limits. Therefore, single statements in proposed §§ 430.23(a) through 430.23(o) have been replaced by two statements in the corresponding locations in today's final rule.

Today's final rule, while adopting sampling plans utilizing one-sided confidence limits, uses different phraseology as compared to the similar sampling plan presented as an alternative in the preamble to the proposed rule. The change in phraseology is explained later in this Discussion of Comments.

2. *Testing burden and reliability of measures of energy consumption for electric refrigerators, electric refrigerator-freezers and freezers.* Comments received recommended that DOE adopt sampling plans which required fewer units of electric refrigerators, electric refrigerator-freezers, and freezers to be tested as compared to the proposed rule in order to reduce the testing burden. Commenters contended that until facilities could be expanded, the proposed sampling plan would result in insufficient test facilities being available to perform testing essential for the development of energy saving designs of refrigeration products. Testing capacity for these products is low because test facilities were previously constructed to meet two needs which have not greatly expanded. First, testing capacity was designed to accommodate an industry certification program which did not require as much testing as the Federal program. Second, testing capacity was designed to provide for the testing and evaluation of new basic models at a rate slower than is needed to accommodate current state and Federal programs which require the development of more efficient products.

The proposed sampling rule specified that, with 95 percent confidence, a range of ±10% about the represented values of the measure of energy consumption should contain the true mean of such measures. In the preamble to the proposed rule, comments were specifically requested which address the need, if any, for modifying the sampling requirements for these products. Specific questions in Section D of the preamble to the proposed rule were designed to solicit the type of data DOE would need in order to determine the advisability of modifying statistical parameters.

Commenters provided this data which included the time required to test one unit; the frequency of introducing new basic models; the number of units of each basic model which would be tested to satisfy sampling provisions using modified sampling parameters; the extent that existing test results can be used to fulfill the requirements of Federal programs; the extent of testing beyond the level previously conducted to support programs either administered by trade associations or conducted for the manufacturer's own purposes; the number of basic models the commenter currently produces; the energy consuming characteristics or features that distinguish the commenter's basic models; the capacity of test facilities used by the commenter; the cost of testing all the commenter's basic models; and the cost of expanding test facilities.

Comments stated that testing of a single unit of a basic model takes as long as 26 days. Because of this long testing period for one unit it is not practical to test units of a sample sequentially because total test times would reach several months. For example, testing four units would take 78 days assuming the first two units were tested simultaneously. Such extended periods would require extending the time between development and introduction of new models. Therefore, unlike other products, manufacturers would need to estimate and select the sample size in advance and simultaneously test all the units likely to be required by the statistical criterion. The disadvantage of this approach is that the results of testing may show that more units were tested than were needed to satisfy the sample's confidence statement. Therefore, testing costs and other burdens would be greater than if the units had been tested sequentially. Data submitted by one commenter showed that with the proposed statistical parameters (i.e., 95% confidence, ±10% tolerance) the selected sample size would be 5 units.

DOE has reviewed these comments and concluded, based on data submitted, that until facilities could be expanded, testing of new basic models with the DOE test procedures would be expected to occupy over half the testing facilities available for testing refrigeration products.

Data was also provided on two other sets of statistical parameters, 95% confidence and ±20% tolerance, and 90% confidence and ±10% tolerance. Only a small difference in testing burden would result from these latter two sets of statistical parameters. In both cases, sample size would be four if the manufacturer desired a probability greater than 90 percent that all required testing could successfully be performed simultaneously.

DOE rejects the set of statistical parameters which include tolerances of ±20% for refrigeration products. Under sampling plans which include such tolerances, the total spread of the true means of measures of energy consumption over all basic models of the product type could be less than the

spread caused by the tolerances of such measures. Therefore, consumers may not be provided information which would be of assistance in making purchasing decisions.

DOE has determined that a sampling plan which specifies 90 percent confidence and ±10 percent tolerances results in a testing program which provides the most reliable data for determining measures of energy consumption and which is consistent with the limitations on capacity of testing facilities available now and expected in the near future. A sampling plan which utilizes one-sided confidence limits and specifies 95 percent confidence requires no more testing compared to the plan which utilizes two-sided confidence limits and specifies 90 percent confidence. Therefore, DOE is prescribing at § 430.23(a) in today's final rule a sampling plan for electric refrigerators, electric refrigerator-freezers and freezers utilizing one-sided confidence limits and 95 percent confidence. The effect of this sampling plan is to require fewer tests as compared to the sampling plan in the proposed rule while at the same time providing meaningful measures of energy consumption.

3. *Testing burden and reliability of measures of energy consumption for central air conditioners.* Those commenting recommended that DOE adopt sampling plans which required fewer units to be tested as compared to either of the distinct plans presented in DOE's proposed rule.

The proposed rule specified that units of only certain basic models need be tested. Specifically, the proposed rule grouped basic models according to the condensing unit used and required that only units of the condenser-evaporator-coil-combination (defined in DOE test procedures) which was expected to have the largest volume of retail sales among all basic models using that condensing unit need be tested. The proposed rule specified 90 percent confidence and tolerances of ±5% for the sampling plans which utilized two-sided confidence limits.

Specific questions in Section E of the preamble to the proposed rule were designed to solicit the type of data DOE would need in order to determine the advisability of modifying sampling plans. Commenters provided this data which included information on the time required to test one unit, the frequency of introducing new basic models, the number of units of each basic model which would be tested to satisfy sampling provisions using modified sampling parameters; the extent that existing test results can be used to fulfill the requirements of Federal programs; the extent of testing beyond the level previously conducted to support programs either administered by trade associations or conducted for the manufacturers' own purposes; the number of basic models the commenter currently produces; the energy consuming characteristics or features that distinguish the commenter's basic models; the capacity of test facilities used by the commenter; and the cost of testing all the commenter's basic models.

Many comments addressed the testing burden associated with the proposed sampling plans. DOE has reviewed the comments and has determined that the extent and impact of testing burden requires further analysis.

Therefore, today's final rule does not include a sampling plan to be used when testing is required to comply with labeling rules prescribed under section 324 of the Act. The sampling plan previously promulgated at § 430.24(m) regarding sampling to be used when testing is required to comply with rules prescribed under section 323(c) of the Act remains in effect.

DOE plans to propose in the near future an amendment to the test procedures for central air conditioners in order to include test procedures for heat pumps. Sampling requirements applicable to the labeling of central air conditioners, and applicable to labeling and representations covered by section 323(c) for heat pumps, will be addressed during that rulemaking process.

4. *Testing burden and reliability of measures of energy consumption for furnaces.* Comments received on the sampling proposal for furnaces recommended that DOE adopt sampling plans which required fewer units to be tested as compared to the proposed rule so that testing burden would be reduced.

The proposed rule specified that, with 95 percent confidence, a range of ±5 percent about the represented values of the measures of energy consumption should contain the true mean of such measures.

Commenters provided information on the time required to test one unit; the frequency of introducing new basic models; the number of units of each basic model which would be tested to satisfy sampling provisions using modified sampling parameters; the extent that existing test results can be used to fulfill the requirements of Federal programs; the number of basic models the commenter currently produces, the energy consuming characteristics or features that distinguish the commenter's basic models; and the effects on the number of prototype units which must be produced to meet sampling requirements.

After reviewing the data submitted and evaluating the extent of testing that would be required, DOE has determined that the sampling plan described in the proposed rule will not result in any significant negative impact to either manufacturers or consumers. DOE notes that the energy consumption of furnaces amounts to approximately 10 percent of the total energy consumed by the Nation and the estimated annual operating cost of furnaces are of the same magnitude as furnace prices. Therefore, it is especially important to maintain the reliability of measures of energy consumption for furnaces at the highest levels in order to better assist consumers in making purchasing decisions which will have a large impact on both the Nation's energy consumption and the cost of energy to consumers.

DOE has, therefore, determined that the proposed sampling plan which specifies 95 percent confidence and ±5 percent tolerances provides the most reliable data for determining measures of energy consumption without creating an unreasonable testing burden. As previously explained, the sampling plan which utilizes one-sided confidence limits and specifies 97½ percent confidence requires no more testing compared to the plan which utilizes two-sided confidence limits and specifies 95 percent confidence. Therefore, DOE is prescribing in today's final rule a sampling plan utilizing one-sided confidence limits and 97½ percent confidence at § 430.23(n).

Special provisions for determining measures of energy consumption for sectional cast-iron boilers, a category of furnaces, are discussed in section 9 of this Discussion of Comments.

5. *Testing burden and reliability of measures of energy consumption for dishwashers, clothes dryers, water heaters, room air conditioners, home heating equipment (not including furnaces), television sets, kitchen ranges and ovens, clothes washers, humidifiers and dehumidifiers.* Commenters recommended that final sampling plans for dishwashers, clothes dryers, water heaters, room air conditioners, home heating equipment (not including furnaces), television sets, kitchen ranges and ovens, clothes washers, humidifiers and dehumidifiers require fewer units to be tested as compared to the proposed sampling plans so that testing burden would be reduced. In each case, however, sufficient data was not

provided nor is otherwise available to DOE to enable DOE to weigh the benefits and burdens of alternative sampling plans. Comments failed to address the specific questions in section E of the preamble to the DOE proposed sampling rule which were designed to solicit the type of data DOE would need in order to determine the advisability of modifying statistical parameters. DOE has reviewed all available information and determined that the sampling requirements as proposed will provide reliable measures of energy consumption without creating an unreasonable testing burden. Therefore, the final rule prescribes sampling plans which require the same number of units to be tested, if sample means are to be used for measures of energy consumption. However, the adoption of sampling plans utilizing one-sided sampling plans requires modifying confidence limits, as discussed in section 1 of this Discussion of Comments. Therefore, for dishwashers, clothes dryers, room air conditioners, home heating equipment (not including furnaces), television sets, kitchen ranges and ovens, clothes washers, humidifiers, and dehumidifiers the final rule specifies 97½ percent confidence levels whereas 95 percent confidence levels were specified in the proposed rule. Such provisions appear in the final sampling rule in the case of dishwashers at § 430.23(c), clothes dryers at § 430.23(d), room air conditioners at § 430.23(f), home heating equipment (not including furnaces), at § 430.23(g), television sets at § 430.23(h), kitchen ranges and ovens at § 430.23(i), clothes washers at § 430.23(j), humidifiers at § 430.23(k), and dehumidifiers at § 430.23(l). Similarly, for water heaters the final rule specifies 95 percent confidence levels whereas 90 percent confidence levels were specified in the proposed rule. Such provision appears in the final rule at § 430.23(e).

Sampling requirements for kitchen ranges and ovens are further discussed in section 8 of this Discussion of Comments.

6. *Reliability of measures of energy consumption other than measures of efficiency.* Commenters recommended that confidence levels and tolerances be applied only to the measures of efficiency (i.e., energy factor, energy efficiency ratio, seasonal energy efficiency ratio, and annual fuel utilization efficiency, which are defined and measured in DOE test procedures), and not to estimated annual operating cost and energy consumption. Commenters noted that it is unreasonable to expect the latter measures to predict accurately any particular consumer's experience because of the variability caused by usage patterns, climate, and local energy costs. Commenters reasoned that such measures should therefore not be subject to requirements of reliability and accuracy.

It should be noted, however, that the estimated annual operating cost is designed to assist consumers in making purchasing decisions by enabling them to compare the energy consuming characteristics of consumer products. To serve this purpose the estimated annual operating cost must provide a reasonably accurate means of comparing such products on a relative basis. The confidence levels and tolerances pertain to the reliability of the measures of energy consumption in making comparisons between like products, and not to the actual operating cost that any particular consumer might experience.

7. *Components manufactured by different suppliers.* Commenters stated that it is often necessary to substitute components manufactured by different suppliers and that these substitutions typically have an effect of less than a few percent on the tested values of the measures of energy consumption. commenters further stated that based on the definitions of the term "basic model" presented in DOE test procedures, it was not clear whether the units which include such component substitutions constituted a new basic model and therefore would require additional testing.

If the tested values of the measures of energy consumption for units having such component substitutions change by only a few percent from the tested values before the substitution, DOE agrees that additional testing of such units would not provide benefit to the consumer commensurate with costs incurred. To clarify the test procedures, wherever the term "basic model" is used in § 430.23, a footnote states that components of similar design may be substituted without necessitating further testing, if the represented values of the measures of energy consumption will not change as a result of the substitution, i.e., the represented values continue to satisfy the sampling confidence statement. With the adoption of sampling plans utilizing one-sided confidence limits, manufacturers may adjust their represented values of the measures of energy consumption from tested values of the measures of energy consumption to compensate for anticipated changes in the energy consuming characteristics of future production units that may include such component substitutions.

The criteria for determining whether a component substitution will create a new basic model which would require additional testing is as follows: A component substitution which affects the tested values of the measures of energy consumption of a product will create a new basic model which will require additional testing if the value of the represented measure of energy consumption no longer satisfies the sampling confidence statement. For example, if a 30 watt condenser fan in a refrigerator-freezer is substituted for a 27 watt condenser fan and if this is the only design change which affects the tested values of the measures of energy consumption, then the total average power needed to operate the refrigerator-freezer may be expected to increase by three watts. However, as compared to the total average power consumption of approximately 500 watts, any changes in the tested values of the measures of energy consumption will be less than errors caused by the rounding specified in DOE test procedures. Therefore, a sample of units containing the substituted condenser fan need not be tested since, by not changing the value of the tested measure of energy consumption, the confidence statement remains satisfied for the represented values of the measures of energy consumption.

As another example, if a 300 watt compressor motor in a refrigerator-freezer is substituted for a 350 watt compressor motor of identical capacity, then the efficiency of such units is likely to be improved and the energy consumption is likely to decrease. However, because the sampling plan utilizes one-sided confidence limits, the values of the tested measures of energy consumption of the basic model are changed such that the confidence statement for the represented values of the measure of energy consumption for this model remains valid. Additional testing may be done in this case if the manufacturer wishes to take advantage of the improvement and reflect it in the represented values for the measures of energy consumption.

As a final example, if a 350 watt compressor motor in a refrigerator-freezer is substituted for a 300 watt compressor motor of identical capacity, then efficiency of such units is likely to decrease and their energy consumption is likely to increase. It is probable that the represented value of the measure of efficiency based on testing units containing the 300 watt compressor

motor will no longer satisfy the sampling confidence statement. In such case, further testing could be needed to establish the represented value of the measures of energy consumption which will satisfy the confidence statement for units which use the 350 watt compressor motor.

8. *Special testing considerations for kitchen ranges and ovens.* Commenters stated that some oven models were distinguished only by the design of the oven doors, i.e., otherwise identical ovens would have either a door containing a window or a solid door. It was further stated that the energy consumptions of such models would differ by only a very small amount and it would therefore be unduly burdensome to require separate testing for different designs of the same oven door.

The National Bureau of Standards has analyzed the differences in energy consumption of oven models using various design of oven doors. Analysis shows that the change in annual operating costs typically is less than one dollar. Analysis also shows that in most cases the estimated annual operating cost would be unaffected by the particular selection of oven doors because the procedure by which such costs are rounded to the nearest dollar would mask any expected changes in operating cost. Therefore, the reliability of measures of energy consumption would not be significantly diminished.

DOE believes that both manufacturers' and consumers' interests would be furthered by determining measures of energy consumption by testing ovens with the door designs likely to result in the greatest energy consumption. Measures of energy consumption for ovens which have identical characteristics other than door design may either be assumed to be the same as for the oven which is actually tested and is likely to consume more energy, or, if the manufacturer chooses, to be determined by further testing.

This change appears in § 430.23(i)(2) which provides that manufacturers need not test basic models which differ from other tested basic models by only the design of oven doors, the use of which leads to improved efficiency and decreased energy consumption and estimated annual operating cost. Any represented values of measures of energy consumption for such basic models shall be the same as for the tested basic model.

Today's rule also contains a clarification of the sampling requirements for conventional ranges and microwave/conventional ranges. Basic models of conventional ranges and microwave/conventional ranges are comprised of basic models of major cooking components (i.e., conventional cooking tops, conventional ovens and microwave ovens). Section 430.23(i)(1) in today's final rule requires the testing for each basic model of conventional cooking tops, conventional ovens and microwave ovens. Measures of energy consumption for basic models of conventional ranges and microwave/conventional ranges are calculated from the results of testing basic models of conventional cooking tops, conventional ovens and microwave ovens. Statistical confidence statements only apply to the results of actual testing and do not relate to calculated measures of energy consumption for conventional ranges and microwave/conventional ranges.

9. *The effects of sectional design of cast iron boilers.* Data submitted showed that the annual fuel utilization efficiency, energy consumption and estimated annual operating cost of sectional cast iron boilers (i.e., cast iron boilers consisting of an assembly of two end sections and a variable number of identical intermediate sections, the number of intermediate sections depending on the desired heating capacity) can be accurately predicted by a linear interpolation based on data obtained from units having the smallest and largest number of intermediate sections. Therefore, little or no new information would result from any requirement for actual testing of middle-sized units.

Data was submitted which showed the efficiencies measured according to DOE test procedures of 15 groups of sectional cast-iron boilers, with each group being made up of boilers identical except for the number of intermediate sections. An analysis of the data submitted shows that linear interpolation for the middle-sided units results in errors in the measure of efficiency of less than two percent compared to actual test results. Since the tolerance of all measures of energy consumption has been established as five percent, DOE has determined that the reliability of measures of energy consumption for the middle-sized units will not be significantly diminished by a linear interpolation based on data obtained from testing units having the smallest and largest number of intermediate sections and the same combustion chamber. Alternatively, a manufacturer may determine measures of energy consumption for sectional cast-iron boilers having any number of intermediate sections by actually testing all sizes of such units.

Linear interpolation is permitted where a consistant geometry exists through a group of sectional cast-iron boilers. This interpolation is inappropriate, and tests are required, whenever irregular geometries exist through a group or changes occur such as addition or omission of baffles, changes in design of intermediate components, or changes in fire box dimensions.

Provisions reflecting this change appear at § 430.23(n). Whenever measures of energy consumption for middle-sized units determined by linear interpolation do not agree with measures of energy consumption determined by actual testing, the values determined by testing will be assumed to be the more reliable values.

In order to explain linear interpolation in detail, DOE will have available for distribution after April 30, 1979, a document entitled "Determining Measures of Energy Consumption for Sectional Cast-Iron Boilers by Linear Interpolation." Copies will be available upon request by contacting James A. Smith, Consumer Products Efficiency Branch, Department of Energy, Mail Station 2221C, 20 Massachusetts Avenue, NW., Washington, D.C. 20545, telephone 202–376–4814.

10. *Effects of the design heating requirement on number of units to be tested.* Commenters provided data which showed that different units of a particular furnace basic model exhibited only a small variation in efficiencies, output and energy consumption while operating under the same test conditions. However, the small variations in output called for very different design heating requirements because output of the different units happened to fall on either side of a division in the design heating requirement charts provided in the DOE test procedures. The different design heating requirements lead to the calculation of very different estimated annual operation costs. Applying the statistical criterion in the sampling plan led to the conclusion that as many as 60 units of this basic model would need to be tested. Those commenting contended that it was unreasonable to base the determination of the number of units to be tested on a highly variable estimated annual operating cost when in fact there was very little difference in the test measurements for those units. Since the test procedures for vented home heating equipment (not including furnaces) utilize the same chart and calculation procedure, these comments apply equally to that product.

DOE has reviewed the data and agrees with these comments. In order to avoid such problems for both vented home heating equipment (not including furnaces) and furnaces, DOE is specifying that the energy consumption and estimated annual operating costs computed for each unit of the sample shall be based on the design heating requirement corresponding to the mean of the heating capacities of the units of the sample. This change eliminates the possibility that a wide range of estimated annual operating costs may result when tests show only a small variation in heating capacity. Provisions for this change appear in today's final rule for furnaces at § 430.23(n)(6) and for vented home heating equipment (not including furnaces) at § 430.23(o)(2).

11. *Consumer products used in recreational vehicles.* Commenters requested DOE to clarify the question of whether consumer products intended for use in recreational vehicles are intended to be included among the products covered by the test procedures. Information provided by those commenting argued that Congress intended that consumer products used in recreational vehicles be considered as consumer products which, if covered at all, would be included under the provisions of 322(a)(14) of the Act dealing with products other than the thirteen types specifically identified and covered by the existing test procedures. Commenters noted that under the test procedures represented values for energy consumption or estimated annual operating cost are to be based on representative average use cycles which are inappropriate for consumer products used in recreational vehicles.

DOE has never intended that consumer products manufactured and marketed products for exclusive use in recreational vehicles be included in the products covered by the test procedures but was previously not aware of any physical or functional differences which distinguish manufactured and marketed for exclusive use in recreational vehicles. These consumer products are distinguishable by characteristics such as the capability of operating with a 12 volt direct current electrical supply, LP-gas fittings and valves for energy input, and special mounting brackets.

Consumer products manufactured and marketed for exclusive use in recreational vehicles which can be distinguished from other consumer products used in households and mobile homes are not included among the consumer products covered by the test procedures.

12. *Phraseology of today's final rule.* Several commenters suggested a particular phraseology which described sampling plans utilizing one-sided confidence limits more succinctly than the phraseology used in the preamble to the proposed rule. Commenters contended, and DOE agrees, that there are no substantive differences between the two phraseologies. DOE is adopting the phraseology favored by the commenters, finding it more succinct and as understandable as the phraseology used in the proposal.

13. *Miscellaneous.* After careful consideration of all of the comments and further consultation with FTC, DOE has made some editorial and minor technical changes that were not discussed above and incorporated them in the final rule prescribed today.

C. *Regulatory Analysis Review.* The proposed rule has been reviewed in accordance with Executive Order 12044 and DOE Order 2030. From the regulatory analysis performed, it was determined that the proposal was significant in nature but did not have major impacts to manufacturers and consumers (imposing annual economic costs of $100 million or more).

(Energy Policy and Conservation Act, Pub. L. 94-163, as amended by Pub. L. 95-619; Department of Energy Organization Act, Pub. L. 95-91).

In consideration of the foregoing, Part 430 of Chapter II of Title 10, Code of Federal Regulations is amended as set forth below, effective May 14, 1979.

Issued in Washington, D.C., April 6, 1979.

Omi G. Walden,
Assistant Secretary, Conservation and Solar Applications.

1. Part 430 of Chapter II of Title 10, Code of Federal Regulations, is amended by establishing a new § 430.23, to read as follows:

§ 430.23 Units to be Tested.

When testing of a covered product is required to comply with section 323(c) of the Act or to comply with rules prescribed under section 324 of the Act, a sample shall be selected and tested comprised of units which are production units, or are representative of production units of the basic model being tested, and shall meet the following applicable criteria.

(a)(1) For each basic model [1] of electric refrigerators and electric refrigerator-freezers, a sample of sufficient size shall be tested to insure that—

(i) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of (A) the mean of the sample or (B) the upper 95 percent confidence limit of the true mean divided by 1.10, and

(ii) Any represented value of the energy factor or other measure of energy consumption of a basic model for which consumer would favor higher values shall be no greater than the lower of (A) the mean of the sample or (B) the lower 95 percent confidence limit of the true mean divided by .90.

(b)(1) For each basic model [1] of freezers, a sample of sufficient size shall be tested to insure that—

(i) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of (A) the mean of the sample or (B) the upper 95 percent confidence limit of the true mean divided by 1.10, and

(ii) Any represented value of the energy factor or other measure of energy consumption of a basic model for which consumers would favor higher values shall be no greater than the lower of (A) the mean of the sample or (B) the lower 95 percent confidence limit of the true mean divided by .90.

(c)(1) For each basic model [1] of dishwashers, a sample of sufficient size shall be tested to insure that—

(i) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of (A) the mean of the sample or (B) the upper 97½ percent confidence limit of the true mean divided by 1.05, and

(ii) Any represented value of the energy factor or other measure of energy consumption of a basic model for which consumers would favor higher values shall be no greater than the lower of (A) the mean of the sample or (B) the lower 97½ percent confidence limit of the true mean divided by .95.

(d)(1) For each basic model [1] of clothes dryers a sample of sufficient size shall be tested to insure that—

(i) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of (A) the mean of the sample or (B) the upper

[1] Components of similar design may be substituted without requiring additional testing if the represented measures of energy consumption continue to satisfy the applicable sampling provision.

97½ percent confidence limit of the true mean divided by 1.05, and

(ii) Any represented value of the energy factor or other measure of energy consumption of a basic model for which consumers would favor higher values shall be no greater than the lower of (A) the mean of the sample or (B) the lower 97½ percent confidence limit of the true mean divided by .95.

(e)(1) For each basic model [1] of water heaters, a sample of sufficient size shall be tested to insure that—

(i) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of (A) the mean of the sample or (B) the upper 95 percent confidence limit of the true mean divided by 1.10, and

(ii) Any represented value of the energy factor or other measure of energy consumption of a basic model for which consumers would favor higher values shall be no greater than the lower of (A) the mean of the sample or (B) the lower 95 percent confidence limit of the true mean divided by .90.

(f)(1) For each basic model [1] of room air conditioners, a sample of sufficient size shall be tested to insure that—

(i) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of (A) the mean of the sample or (B) the upper 97½ percent confidence limit of the true mean divided by 1.05, and

(ii) Any represented value of the energy efficiency ratio or other measure of energy consumption of a basic model for which consumers would favor higher values shall be no greater than the lower of (A) the mean of the sample or (B) the lower 97½ percent confidence limit of the true mean divided by .95.

(g)(1) For each basic model [1] of unvented home heating equipment (not including furnaces), a sample of sufficient size shall be tested to insure that—

(i) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of (A) the mean of the sample or (B) the upper 97½ percent confidence limit of the true mean divided by 1.075, and

(ii) Any represented value of the annual fuel utilization efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be not greater than the lower of (A) the mean of the sample or (B) the lower 97½ percent confidence limit of the true mean divided by .925.

(h)(1) For each basic model [1] of television sets, a sample of sufficient size shall be tested to insure that—

(i) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of (A) the mean of the sample or (B) the upper 97½ percent confidence limit of the true mean divided by 1.05, and

(ii) Any represented value of the energy factor or other measure of energy consumption of a basic model for which consumers would favor higher values shall be no greater than the lower of (A) the mean of the sample or (B) the lower 97½ percent confidence limit of the true mean divided by .95.

(i)(1) Except as provided in paragraph (i)(2) of this section, for each basic model [1] of conventional cooking tops, conventional ovens and microwave ovens a sample of sufficient size shall be tested to insure that—

(i) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of (A) the mean of the sample or (B) the upper 97½ percent confidence limit of the true mean divided by 1.05, and

(ii) Any represented value of the energy factor or other measure of energy consumption of a basic model for which consumers would favor higher values shall be no greater than the lower of (A) the mean of the sample or (B) the lower 97½ percent confidence limit of the true mean divided by .95.

(2) Basic models need not be tested which differ from other tested basic models by only the design of oven doors the use of which leads to improved efficiency and decreased energy consumption and estimated annual operating cost. Any represented values of measures of energy consumption for basic models not tested shall be the same as for the tested basic model.

(j)(1) For each basic model [1] of clothes washers, a sample of sufficient size shall be tested to insure that—

(i) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of (A) the mean of the sample or (B) the upper 97½ percent confidence limit of the true mean divided by 1.05, and

(ii) Any represented value of the energy factor or other measure of energy consumption of a basic model for which consumers would favor higher values shall be no greater than the lower of (A) the mean of the sample or (B) the lower 97½ percent confidence limit of the true mean divided by .95.

(k)(1) For each basic model [1] of humidifiers, a sample of sufficient size shall be tested to insure that—

(i) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of (A) the mean of the sample or (B) the upper 97½ percent confidence limit of the true mean divided by 1.05, and

(ii) Any represented value of the energy factor or other measure of energy consumption of a basic model for which consumers would favor higher values shall be no greater than the lower of (A) the mean of the sample or (B) the lower 97½ percent confidence limit of the true mean divided by .95.

(l)(1) For each basic model [1] of dehumidifier, a sample of sufficient size shall be tested to insure that—

(i) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of (A) the mean of the sample or (B) the upper 97½ percent confidence limit of the true mean divided by 1.10, and

(ii) Any represented value of the energy factor or other measure of energy consumption of a basic model for which consumers would favor higher values shall be no greater than the lower of (A) the mean of the sample or (B) the lower 97½ percent confidence limit of the true mean divided by .90.

(m) Reserved for central air conditioners.

(n)(1) For each basic model [1] of furnaces, other than basic models of those sectional cast-iron boilers which may be aggregated into groups having identical intermediate sections and combustion chambers, a sample of sufficient size shall be tested to insure that—

(i) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of (A) the mean of the sample or (B) the upper

97½ percent confidence limit of the true mean divided by 1.05, and

(ii) Any represented value of the annual fuel utilization efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be no greater than (A) the mean of the sample or (B) the lower 97½ percent confidence limit of the true mean divided by .95.

(2) For the lowest capacity basic model[1] of a group of basic models of those sectional cast-iron boilers having identical intermediate sections and combustion chambers, a sample of sufficient size shall be tested to insure that—

(i) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of (A) the mean of the sample or (B) the upper 97½ percent confidence limit of the true mean divided by 1.05, and

(ii) Any represented value of the fuel utilization efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be no greater than the lower of (A) the mean of the sample or (B) the lower 97½ percent confidence limit of the true mean divided by .95.

(3) For the highest capacity basic model[1] of a group of basic models of those sectional cast-iron boilers having identical intermediate sections and combustion chambers, a sample of sufficient size shall be tested to insure that—

(i) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of (A) the mean of the sample or (B) the upper 97½ percent confidence limit of the true mean divided by 1.05, and

(ii) Any represented value of the fuel utilization efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be no greater than the lower of (A) the mean of the sample or (B) the lower 97½ percent confidence limit of the true mean divided by .95.

(4) For basic models[1] of capacity other than the highest or lowest of the group of basic models[1] of sectional cast iron boilers having identical intermediate sections and combustion chambers, represented values of measures of energy consumption shall be determined by either—

(i) A linear interpolation of data obtained for the smallest and largest capacity units of the family, or

(ii) Testing a sample of sufficient size to insure that (A) any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of (*1*) the mean of the sample or (*2*) the upper 97½ percent confidence limit of the true mean divided by 1.05, and (B) any represented value of the energy factor or other measure of energy consumption of a basic model for which consumer would favor higher values shall be no greater than the lower of (*1*) the mean of the sample or (*2*) the lower 97½ percent confidence limit of the true mean divided by .95.

(5) Whenever measures of energy consumption determined by linear interpolation do not agree with measures of energy consumption determined by actual testing, the values determined by testing will be assumed to be the more reliable values.

(6) In calculating the measures of energy consumption, for each unit tested use the design heating requirement corresponding to the mean of the capacities of the units of the sample.

(o)(1) For each basic model[1] of vented home heating equipment (not including furnaces) a sample of sufficient size shall be tested to insure that—

(i) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of (A) the mean of the sample or (B) the upper 97½ percent confidence limit of the true mean divided by 1.05, and

(ii) Any represented value of the fuel utilization efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be no greater than the lower of (A) the mean of the sample or (B) the lower 97½ percent confidence limit of the true mean divided by .95.

(2) In calculating the measures of energy consumption for each unit tested use the design heating requirement corresponding to the mean of the capacities of the units of the sample.

§ 430.24 [Amended]

2. In Part 430 of Chapter II of Title 10, Code of Federal Regulations, § 430.24 is amended by deleting and reserving paragraphs (a) through (1), and paragraphs (n) and (o). Paragraph (m) is retained in full.

3. In Part 430 of Chapter II of Title 10, Code of Federal Regulations, paragraph 2.2.2.4 is added to appendix I to read as follows:

Appendix I—Uniform Test Method For Measuring the Energy Consumption of Conventional Ranges, Conventional Cooking Tops, Conventional Ovens, Microwave Ovens and Microwave/Conventional Ranges

2.2.2.4 Test gas. A basic model of a convertible cooking appliance shall be tested with natural gas, but may also be tested with propane. Any basic model of a conventional range, conventional cooking top, or conventional oven which is designed to operate using only natural gas as the energy source must be tested with natural gas. Any basic model of a conventional range, conventional cooking top, or conventional oven which is designed to operate using only LP gas as the gas energy source must be tested with propane gas.

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